

44. (New) A botulinum toxin type A comprising a leucine-based motif structural modification effective to alter a biological persistence of the botulinum toxin relative to an identical botulinum toxin type A without the structural modification.

45. (New) The botulinum toxin type A of claim 44 wherein the structural modification is an addition of a leucine-based motif to the botulinum toxin type A.

46. (New) The botulinum toxin type A of claim 44 wherein the structural modification is an addition of a leucine based motif with the sequence of x(D or E)xxxL(L, I or M) wherein x is any amino acid.

47. (New) The botulinum toxin type A of claim 44 wherein the structural modification is an addition of a leucine based motif selected from the group consisting of xDxxxLL, xExxxLL, xDxxxLI, xExxxLI, xDxxxLM and xExxxLM wherein x is any amino acid.

48. (New) The botulinum toxin type A of claim 44 wherein the structural modification is a deletion of one or more amino acids in a leucine-based motif of a botulinum toxin type A light chain.


49. (New) The botulinum toxin type A of claim 44 wherein the biological persistence of the botulinum toxin type A is reduced relative to a botulinum toxin type A without the structural modification.

50. (New) The botulinum toxin type A of claim 44 wherein the biological persistence of the botulinum toxin type A toxin is increased relative to a botulinum toxin type A without the structural modification.

51. (New) The botulinum toxin type A of claim 44 wherein the toxin is recombinantly produced.

52. (New) The botulinum toxin type A of claim 44 wherein the biological persistence is altered at least in part due to an altered biological half-life of the botulinum toxin type A.

53. (New) A botulinum toxin comprising three amino acid sequence regions:

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- a) a first region effective for neuronal binding;
 - b) a second region effective to translocate the botulinum toxin or a part thereof across a membrane; and
 - c) a third region effective to inhibit neurotransmitter release,

at least one of the first, the second and the third regions being derived from a botulinum toxin, wherein the botulinum toxin comprises a leucine-based motif structural modification effective to alter a biological persistence of the botulinum toxin relative to an identical botulinum toxin without the structural modification.

54. (New) The botulinum toxin of claim 53 wherein the botulinum toxin is a member selected from a group consisting of botulinum toxin serotypes A, B, C₁, D, E, F, G, and mixtures thereof.

55. (New) The botulinum toxin of claim 53 wherein the third region is derived from botulinum toxin serotype A.

56. (New) The botulinum toxin of claim 53 wherein the structural modification is an addition of a leucine-based motif.

57. (New) The botulinum toxin of claim 53 wherein the structural modification is an addition of a leucine based motif with the sequence of x(D or E)xxxL(L, I or M) wherein x is any amino acid.

58. (New) The botulinum toxin of claim 53 wherein the structural modification is an addition of a leucine based motif selected from the group consisting of xDxxxLL, xExxxLL, xDxxxLI, xExxxLI, xDxxxLM and xExxxLM wherein x is any amino acid.

59. (New) The botulinum toxin of claim 53 wherein the structural modification is a deletion of one or more amino acids in a leucine-based motif of the third region.

60. (New) The botulinum toxin of claim 53 wherein the biological persistence of the botulinum toxin is reduced relative to an identical botulinum toxin without the structural modification.

61. (New) The botulinum toxin of claim 53 wherein the biological persistence of the botulinum toxin is increased relative to an identical botulinum toxin without the structural modification.

62. (New) The botulinum toxin of claim 53 wherein at least one of the first, the second and the third regions is recombinantly produced.

63. (New) The botulinum toxin of claim 53 wherein at least one of the first, the second and the third regions is isolated from a naturally occurring botulinum toxin.

64. (New) The botulinum toxin of claim 53 wherein the biological persistence is altered at least in part due to an altered biological half-life of the botulinum toxin.
